

CLAIMS

1. A device for simultaneously acquiring a temperature and a respiration rate of a patient, the device comprising:

a probe;

a temperature sensing element coupled to the probe;

a disposable cover that can be positioned over the probe; and

a respiration sensing element coupled to the disposable cover.

2. The device of claim 1 wherein the disposable cover includes a plate, and wherein the respiration sensing element is coupled to the plate.

3. The device of claim 2 wherein the plate is positioned at an angle of less than ninety degrees with respect to a longitudinal axis of the disposable cover so that the plate can rest on the patient's upper lip beneath the patient's nose.

4. The device of claim 1 wherein the probe includes a proximal end and a distal end, and wherein the temperature sensing element is positioned at the distal end in order to sense the patient's sublingual temperature when the probe is inserted into the patient's mouth.

5. The device of claim 1 wherein the probe includes a proximal end and a distal end, and wherein a collar is positioned at the proximal end.

6. The device of claim 1 wherein the probe includes a first connector and the disposable cover includes a second connector that can be connected to the first connector when the disposable cover is positioned over the probe.

7. The device of claim 6 wherein at least one of patient monitoring equipment and data recording equipment provides power to the temperature sensing element and to the respiration sensing element via the connection between the first and second connectors.

8. The device of claim 6 wherein the temperature sensing element and the respiration sensing element provide at least one signal representing a sensed temperature and a sensed respiration rate to at least one of patient monitoring equipment and data recording equipment via the connection between the first and second connectors.

9. The device of claim 1 wherein the temperature sensing element includes a thermistor.

10. The device of claim 1 wherein the temperature sensing element includes a thermocouple.

11. The device of claim 1 wherein:

the probe includes at least one light-emitting diode and at least one photodiode,

the light-emitting diode emitting light toward the respiration sensing element,

the respiration sensing element reflecting the emitted light,

the at least one photodiode receiving the reflected light, and

the photodiode generating a signal representing the respiration rate based on the received light.

12. The device of claim 11 wherein the respiration sensing element reflects the light emitted by the light-emitting diode in response to a change in temperature as the patient inhales and exhales.

13. The device of claim 11 wherein:

the respiration sensing element is sensitive to a component of exhaled air,

the respiration sensing element changing color upon sensing the component of exhaled air, and

the photodiode sensing the change in color and generating a signal representing the presense of the component of exhaled air.

14. The device of claim 13 wherein the respiration sensing element includes a carbon dioxide sensitive dye.
15. The device of claim 13 wherein the respiration sensing element is sensitive to moisture.
16. The device of claim 1 wherein the respiration sensing element is a separate element from the temperature sensing element so that the respiration sensing element can be moved independently of the temperature sensing element with respect to at least one of the patient's nose and mouth.
17. The device of claim 1 wherein the respiration sensing element is positioned on the disposable cover to sense primarily nasal respiration when the patient's mouth is closed over the disposable cover.
18. The device of claim 1 wherein the disposable cover is constructed of at least one of a polyethylene and a polypropylene.
19. The device of claim 1 wherein the probe is constructed of at least one of a metal, a metal alloy, and a thermally-conductive polymer.

20. A device for simultaneously acquiring a temperature and a respiration rate of a patient, the device comprising:

a probe including a temperature sensing element, a transmitter, and a receiver; and

a probe cover that can be positioned over the probe, the probe cover including a respiration sensing element,

the transmitter sending a signal toward the respiration sensing element,

the respiration sensing element reflecting the signal toward the receiver, and

the receiver generating an output representing the respiration rate based on the reflected signal.

21. The device of claim 20 wherein the transmitter is at least one light-emitting diode and the receiver is at least one photodiode.

22. The device of claim 20 wherein the respiration sensing element reflects the signal sent by the transmitter in response to a change in temperature as the patient inhales and exhales.

23. The device of claim 20 wherein:

the respiration sensing element is sensitive to a component of exhaled air,

the respiration sensing element changing color upon sensing the component of exhaled air; and

the receiver sensing the change in color and generating an output representing the presense of the component of exhaled air.

24. The device of claim 23 wherein the respiration sensing element includes a carbon dioxide sensitive dye.

25. The device of claim 23 wherein the respiration sensing element is sensitive to moisture.

26. The device of claim 20 wherein the probe cover includes a plate, and wherein the respiration sensing element is coupled to the plate.

27. The device of claim 26 wherein the plate is positioned at an angle of less than ninety degrees with respect to a longitudinal axis of the probe cover so that the plate can rest on the patient's upper lip beneath the patient's nose.

28. The device of claim 20 wherein the probe includes a proximal end and a distal end, and wherein the temperature sensing element is positioned at the distal end in order to sense the patient's sublingual temperature when the probe is inserted into the patient's mouth.

29. The device of claim 20 wherein the probe includes a proximal end and a distal end, and wherein a collar is positioned at the proximal end.

30. The device of claim 20 wherein the probe includes a first connector and the probe cover includes a second connector that can be connected to the first connector when the probe cover is positioned over the probe.

31. The device of claim 30 wherein at least one of patient monitoring equipment and data recording equipment provides power to the temperature sensing element and to the respiration sensing element via the connection between the first and second connectors.

32. The device of claim 30 wherein the temperature sensing element and the respiration sensing element provide at least one signal representing a sensed temperature and a sensed respiration rate to at least one of patient monitoring equipment and data recording equipment via the connection between the first and second connectors.

33. The device of claim 20 wherein the temperature sensing element includes a thermistor.

34. The device of claim 20 wherein the temperature sensing element includes a thermocouple.

35. The device of claim 20 wherein the respiration sensing element is a separate element from the temperature sensing element so that the respiration sensing element can be moved independently of the temperature sensing element with respect to at least one of the patient's nose and mouth.

36. The device of claim 20 wherein the respiration sensing element is positioned on the probe cover in order to sense primarily nasal respiration when the patient's mouth is closed over the probe cover.

37. The device of claim 20 wherein the probe cover is constructed of at least one of a polyethylene and a polypropylene.

38. The device of claim 20 wherein the probe is constructed of at least one of a metal, a metal alloy, and a thermally-conductive polymer.

39. A method of simultaneously acquiring a temperature and a respiration rate of a patient, the method comprising:

covering a probe with a disposable cover, a temperature sensing element being coupled to the probe, a respiration sensing element being coupled to the disposable cover;

inserting the probe and the disposable cover into the patient's mouth; and

simultaneously sensing a temperature of the patient and a respiration rate of the patient.

40. The method of claim 39 and further comprising:

removing the probe and the disposable cover from the patient's mouth;

removing the disposable cover from the probe; and

disposing of the disposable cover to prevent cross-contamination between patients.

41. The method of claim 39 wherein the disposable cover includes a plate positioned at an angle of less than ninety degrees with respect to a longitudinal axis of the disposable cover, and further comprising resting the plate on the patient's upper lip beneath the patient's nose.

42. The method of claim 39 and further comprising sensing a sublingual temperature of the patient when the probe is inserted into the patient's mouth.

43. The method of claim 39 and further comprising attaching a first connector on the probe to a second connector on the disposable cover in order to mechanically couple the disposable cover to the probe and to electrically connect the respiration sensing element to the probe.

44. The method of claim 43 and further comprising providing power from at least one of patient monitoring equipment and data recording equipment to the temperature sensing element and to the respiration sensing element via the connection between the first and second connectors.

45. The method of claim 43 and further comprising generating at least one signal representing a sensed temperature and a sensed respiration rate.

46. The method of claim 45 and further comprising providing the at least one signal to at least one of patient monitoring equipment and data recording equipment via the connection between the first and second connectors.

47. The method of claim 39 and further comprising:

sending light from at least one light-emitting diode coupled to the probe toward the respiration sensing element, the respiration sensing element reflecting the light sent by the light-emitting diode;

receiving the reflected light with at least one photodiode; and

generating a signal representing the respiration rate based on the light received by the at least one photodiode.

48. The method of claim 47 and further comprising sensing a change in temperature when the patient inhales and exhales, and reflecting the light sent by the light-emitting diode in response to the change in temperature.

49. The method of claim 47 and further comprising:

sensing a component of exhaled air with the respiration sensing element;

changing a color of the respiration sensing element in response to the sensed component of exhaled air;

sensing the change in color with the at least one photodiode; and

generating a signal representing the presense of the component of exhaled air based on the sensed change in color.

50. The method of claim 39 and further comprising moving the respiration sensing element independently of the temperature sensing element with respect to at least one of the patient's nose and mouth.



GE Docket No.: 135783IT

51. The method of claim 39 and further comprising sensing primarily nasal respiration when the patient's mouth is closed over the disposable cover.